WHAT IS CLAIMED IS:

1. A system for connecting a first plurality of signal lines to a second plurality of signals lines, comprising:

a device-under test (DUT) assembly comprising a DUT board having a plurality of spine assemblies disposed thereon out of a plane of the DUT board, each spine assembly having a first outer face, a second outer face, and a first plurality of contacts on at least one of the first and second outer faces in electrical contact with a subset of the first signal lines, the DUT assembly also including a first mechanical alignment feature; and

a connector assembly comprising a plurality of clamping assemblies corresponding to and arranged to receive the plurality of spine assemblies, each clamping assembly comprising a first inner face, a second inner face substantially parallel to the first inner face, and a second plurality of contacts on at least one of the first and second inner faces in electrical contact with a subset of the second signal lines, each clamping assembly being independently suspended within the connector assembly and including a second mechanical alignment feature;

wherein the second contacts of each clamping assembly align with the first contacts of the corresponding spine assembly through interaction of the first and second mechanical alignment features, and wherein electrical connections between the first and second contacts are formed when the first and second inner faces of each clamping assembly are clamped to the first and second outer faces of the corresponding spine assembly, thereby electrically connecting the first and second signal lines.

2. The system of claim 1 wherein the DUT board is circular.

3. The system of claim 2 wherein the spine assemblies are arranged radially on the circular DUT board.

4. The system of claim 1 wherein the DUT board is rectangular.

5. The system of claim 4 wherein the spine assemblies are arranged in a rectilinear pattern on the rectangular DUT board.

6. The system of claim 1 wherein each of the spine assemblies comprises a rigid circuit board having a plurality of conductors embedded therein connecting the first contacts and the first signal lines.

7. The system of claim 1 wherein each of the spine assemblies comprises a rigid structure supporting a flexible circuit having a plurality of conductors embedded therein connecting the first contacts and the first signal lines.

8. The system of claim 7 wherein the rigid assembly includes a flexible section which provides backing for the first contacts and facilitates contact between the first and second contacts.

9. The system of claim 7 wherein the DUT board comprises third contacts thereon corresponding to the first signal lines which interface with the conductors in the flexible circuit.

10. The system of claim 9 wherein each rigid structure is disposed on the DUT board over the third contacts, and a portion of the flexible circuit is disposed between the rigid structure and the DUT board.

11. The system of claim 10 wherein each rigid structure comprises a flexible section which provides backing for the portion of the flexible circuit between the rigid structure and the DUT board and facilitates contact between the flexible circuit and the third contacts.

12. The system of claim 1 wherein the first contacts are disposed on both of the first and second outer faces of each spine assembly.

13. The system of claim 1 wherein the first contacts comprise either of pads or bumps.

14. The system of claim 1 wherein each spine assembly comprises a substantially flat portion which is disposed substantially normal to the plane of the DUT board.

15. The system of claim 14 wherein the first mechanical alignment feature comprises at least one slot in the flat portion of the spine assembly for receiving the second mechanical alignment feature in the corresponding clamping assembly.

16. The system of claim 15 wherein the first mechanical alignment feature comprises two slots at opposing ends of the flat portion of the spine assembly.

17. The system of claim 1 wherein connector assembly is circular.

18. The system of claim 17 wherein the clamping assemblies are arranged radially on the circular connector assembly.

19. The system of claim 1 wherein the connector assembly is rectangular.

20. The system of claim 19 wherein the clamping assemblies are arranged in a rectilinear pattern on the rectangular connector assembly.

21. The system of claim 1 wherein the first and second inner faces of each clamping assembly comprise rigid circuit boards each having a plurality of conductors embedded therein connecting the second contacts and the second signal lines.

22. The system of claim 1 wherein the first and second inner faces of each clamping assembly comprise flexible circuits having a plurality of conductors embedded therein connecting the second contacts and the second signal lines.

23. The system of claim 1 wherein the connector assembly further comprises a plurality of actuators operable to force the first and second inner faces of each clamping assembly toward each other, and thereby clamp the first and second inner faces to the first and second outer faces of the corresponding spine assembly.

24. The system of claim 23 wherein the actuators comprise pneumatic devices.

25. The system of claim 24 wherein each clamping assembly further comprises two press plates for distributing pressure from corresponding ones of the pneumatic devices, each press plate being associated with one of the first and second inner faces.

26. The system of claim 1 wherein the second contacts are disposed on both of the first and second inner faces of each clamping assembly.

27. The system of claim 1 wherein the second contacts comprise either of pads or bumps.

28. The system of claim 1 wherein the second mechanical alignment feature on each clamping assembly comprises at least one alignment member for engaging with the first mechanical alignment feature on the corresponding spine assembly.

29. The system of claim 28 wherein each alignment member comprises a groove and wherein the first mechanical alignment feature comprises at least one slot in the corresponding spine assembly.

30. The system of claim 1 further comprising a kinematic alignment system for aligning the DUT assembly and the connector assembly such that the spine assemblies are aligned with the clamping assemblies.

31. The system of claim 30 wherein the kinematic alignment system comprises three kinematic alignment grooves on the DUT assembly, three corresponding kinematic alignment grooves on the connector assembly, and three kinematic alignment balls, each of

which simultaneously contacts one of the kinematic alignment grooves on the DUT assembly and the corresponding kinematic alignment groove one the connector assembly when the connector assembly and the DUT assembly are docked.

32. The system of claim 31 wherein the kinematic alignment balls are each mounted on a corresponding shaft which is slidably coupled to one of the connector and DUT assemblies.

33. The system of claim 1 further comprising a lifting mechanism for facilitating docking of the DUT and connector assemblies.

34. The system of claim 33 wherein the lifting mechanism comprises a lifting post on the DUT assembly and an air cylinder on the connector assembly having a lifting post receiver aperture, actuation of the air cylinder when the lifting post is inserted in the aperture enabling docking of the DUT and connector assemblies.

35. The system of claim 34 wherein the air cylinder further comprises and emergency brake operable to ensure the DUT and connector assemblies remain docked if air pressure to the air cylinder is lost.

36. The system of claim 1 wherein the DUT assembly comprises a plurality of probe needles corresponding to the first signals arranged on the DUT board opposite the spine assemblies.

37. The system of claim 36 wherein the probe needles are configured to contact a single semiconductor wafer.

38. The system of claim 36 wherein the probe needles are configured to contact a plurality of semiconductor wafers.

39. The system of claim 1 wherein the DUT assembly comprises a plurality of sockets corresponding to the first signals arranged on the DUT board opposite the spine assemblies.

40. The system of claim 1 wherein each clamping assembly comprises flexible components by which the clamping assembly is secured to the connector assembly, the flexible components enabling the clamping assembly to move relative to the connector assembly in a plurality of degrees of freedom.

41. A test system for testing semiconductor wafers comprising the system of claim 1.

42. A test system for testing integrated circuit packages comprising the system of claim 1.

43. A system for connecting a first plurality of signal lines to a second plurality of signals lines, comprising:

a device-under test (DUT) assembly comprising a plurality of DUT boards, each DUT board having a first outer face at an end and on one side of the DUT board, a second

outer face at the end and on the other side of the DUT board, and a first plurality of contacts on at least one of the first and second outer faces in electrical contact with a subset of the first signal lines, the DUT assembly also including a first mechanical alignment feature; and

a connector assembly comprising a plurality of clamping assemblies corresponding to and arranged to receive the ends of the plurality of DUT boards, each clamping assembly comprising a first inner face, a second inner face substantially parallel to the first inner face, and a second plurality of contacts on at least one of the first and second inner faces in electrical contact with a subset of the second signal lines, each clamping assembly being independently suspended within the connector assembly and including a second mechanical alignment feature;

wherein the second contacts of each clamping assembly align with the first contacts of the corresponding DUT board through interaction of the first and second mechanical alignment features, and wherein electrical connections between the first and second contacts are formed when the first and second inner faces of each clamping assembly are clamped to the first and second outer faces of the corresponding DUT board, thereby electrically connecting the first and second signal lines.